

cells; *per.*, peritoneum; *pyr.c.*, pyramidal cells; *s.c.*, sensory cells; *s.d.g.*, spermiducal gland (prostate); *sep.*, septum 7/8; *sept.* and *sept.m.*, septal membrane; *s.f.*, secondary funnel; *s.f.'*, seta-follicle; *sh.*, connective-tissue sheath round the dorsal vessel; *s.o.*, spermathecal opening; *sp.b.*, sperm-blasts; *sp.c.*, spherical cells; *sp.d.*, spermiduct; *sp.m.*, sperm-morula; *sp.s.*, sperm-sac; *st.l.*, shorter twisted lobe; *t.b.*, tigroid bodies; *tc.*, testis-cells; *v.*, vesicle; *y.c.*, yolk-cells; *y.sp.*, yolk-patelets.

LI.—*Notes on the Species of Notomys, the Australian Jerboa-rats.* By OLDFIELD THOMAS.

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THE interesting jerboa-rats forming the genus *Notomys* have long been in a state of considerable confusion as regards the species that exist, or, rather, have existed; for it is to be feared that few of them still survive, except in the centre and north of the continent.

When Central Australia was being explored under the direction of Prof. Baldwin Spencer, a certain number of specimens were obtained, and Mr. Waite published some valuable notes on these\*. He formed on them the groups *Podanomalus* and *Thylacomys* (which he afterwards renamed *Ascopharynx*); but, as I have elsewhere † shown, these names should be merged in the earlier *Notomys* of Lesson.

The throat-pouch described by Mr. Waite appears to be present in most if not all of the species, and would seem to be a skin-gland, such as many rodents, bats, and marsupials possess in a similar situation. Its use is probably of a sexually attractive nature, and I cannot at all accept the suggestion of Mr. Waite that the pouch might be of use for storing food, as is the case with the American Geomyidæ and the European Hamsters. Its structure and general appearance seem to me to preclude any such possibility.

The two main causes of the confusion that exists as to the species are, firstly, the publication by Gray of several names without descriptions, and, secondly, the fact that Gould, who had an excellent hunter's knowledge of the forms dealt with, knew nothing and gave no descriptions of the skulls, by which alone the species can be satisfactorily determined.

The following notes are based on a study of the series in the British Museum, which contains specimens obtained by

\* P. Roy. Soc. Victoria, (2) x. pt. ii. p. 117 (1898).

† Ann. & Mag. Nat. Hist. (7) xvii. p. 83 (1906).

Sturt, Mitchell, and the earlier explorers, but, sad to say, comparatively few recent examples, as these interesting animals seem to have become very rare, if not altogether extinct, in the more inhabited parts of Australia. The types of all the species, except *mitchelli* and, if a *Notomys, conditor*, are in the Museum collection.

### 1. *Notomys longicaudatus*, Gould.

*Hapalotis longicaudata*, Gould, P. Z. S. 1844, p. 104; id. Mamm. Austr. iii. pl. viii. (1845).

Largest of genus; hind foot about 45 mm.; skull about 39 mm.

The usual dull brown above and greyish below. Tail very long, well tufted. Skull large, heavy, with large well-open palatal foramina and large bullæ. Upper molar series 6.5 mm.

*Hab.* Western Australia. Typical specimens from Moore's River, collected by Gilbert for the Gould Collection. A third specimen received in the Tomes Collection.

*Type* (lectotype). Female. B.M. no. 44. 7. 9. 15.

### 2. *Notomys sturti*, sp. n.

A long-tailed species, rather smaller than *N. longicaudatus*.

Proportions about as in *longicaudatus*, though the feet are relatively larger. Colour apparently about as in that species, but the only specimen has had the distal part of the fur singed off, so that the exact shade cannot be described. Feet very slender.

Skull apparently similar to that of *N. longicaudatus*, but smaller in all dimensions. There is, however, no evidence as to the size of the bullæ.

Dimensions of the type (measured on skin):—

Head and body 132 mm.; tail 200; hind foot 45.

Skull: back of frontals to tip of nasals 25.6 (in *N. longicaudatus* 28.5); nasals 13.8; interorbital breadth 6.5; palatilar length 16.3; palatal foramina 8 × 2.3; upper molar series 5.8.

*Hab.* Interior of New South Wales in the Lower Darling region. Type "captured in the Coonbaralba Range about 85 miles from Laidley's Ponds." This would appear to be in what is now Farnell Country.

*Type.* Adult female. B.M. no. 46. 5. 14. 43. Collected July 1845, and presented by Capt. Charles Sturt, in whose honour I have thought it might suitably be named.

This interesting specimen is one of the remains of Capt. Sturt's famous expedition of 1844-45 into Central Australia. Rats of this genus are frequently mentioned in the course of his 'Narrative,' and were said to be then excessively common. But I have not been able to find any reference which can be certainly assigned to this particular animal.

The species is readily recognizable by its long tail and other resemblances to *N. longicaudatus*, combined with its markedly smaller size.

"A rat like a diminutive kangaroo, called Tälāmbā by the natives."—*C. Sturt*.

### 3. *Notomys gouldi*, Gould.

The synonymy of this species almost defies elucidation, owing to Gould's misdeterminations, to Gray's publication of names without descriptions, and to the belated publication of the plates of the 'Erebus' and 'Terror' in 1875, though they were quoted by other authors far earlier. The following appears to be an approximation to the truth:—

*Hapalotis gouldi*, Gray, Grey's Journ. ii., Appendix, p. 404 (1841) (nomen nudum).

Id. List Mamm. B.M. p. 116 (1843) (nom. nud.).

*Hapalotis mitchelli*, Gould, Mamm. Austr. iii. pl. ix. (1845). W. Australia; nec *Dipus mitchelli*, Og. Specimen B.M. no. 7. 1. 1. 135 received with the Tomes Collection.

*Hapalotis gouldi*, Gould, P. Z. S. 1851, p. 127 (nom. nud.).

Id. Mamm. Austr. iii., Introduction, p. xxxv (1863). "*H. gouldi* of Gray will be the correct designation of the animal I have called *H. mitchelli*."

*Hapalotis richardsoni*, Gray, Voy. 'Erebus' and 'Terror,' Mammals, p. 12 d, pl. xxviii. fig. 2 (1875). Swan River. Type, B.M. no. 43. 8. 21. 3.

*Notomys gouldi*, Thos. P. Z. S. 1906, p. 767.

*Hab.* Western Australia (Salt R., Dwaladine, Stockpool, Albany).

*Type.* B.M. no. 7. 1. 1. 135.

Size rather small; hind foot about 36 mm.; skull attaining 32.5 mm. in greatest length. Palatal foramina and choanæ narrow.

The common West-Australian species, found in some numbers there by Shortridge in 1906.

### 4. *Notomys macrotis*, sp. n.

*Hapalotis macrotis*, Gerrard, Cat. Bones Mamm. B.M. p. 171 (1862) (nom. nud.); Gould, Mamm. Austr. i., Introd. p. xxxv (1863) (nom. nud.).

Very similar to *N. gouldi*, but larger, the hind foot about

40 mm., the skull some 2 or 3 mm. larger than in that animal. Fur rather coarser. Colour apparently similar. Interorbital space comparatively broad. Palatal foramina large, open, about 2.6 mm. in breadth as compared with 1.8 in *gouldi*. Choanæ also markedly broader, nearly 3 mm. in breadth. Orthodont; incisive index of type 68°.

Dimensions of type:—

Head and body (as originally stuffed) 118 mm.; tail (imperfect); hind foot 40.5; ear 26.

Skull: upper length from back of parietals 30; length of nasals 12.5; interorbital breadth 6.1; palatilar length 14; palatal foramina 6.5 × 2.6; upper molar series 5.5.

*Hab.* "Interior of Western Australia, on Moore's River."

*Type.* Adult skin with imperfect skull. B.M. no. 44.7.9.14, the skull formerly registered as 44.10.15.2. Collected by John Gilbert, and received with the Gould Collection.

This species was rightly distinguished by Gray from *N. gouldi*, but never described. I use, however, the suitable name he selected for it.

It is readily distinguishable by its large and open palatal foramina.

Two specimens of it are in the Museum. One, the type, has its skull comparatively perfect, the back of the brain-case only being gone. In the other, a skin also received in the Gould Collection, the middle portion of the skull is alone present, but this is enough to show the characteristic palatal foramina and choanæ.

##### 5. *Notomys mitchelli*, Og.

*Dipus mitchelli*, Ogilb. Trans. Linn. Soc. xviii. p. 130 (1841).

Size comparatively small, the hind foot about 33 mm., the skull about 30 mm. in total length. Colour fawn above, whitish below. Tail long, pencilled, bicolor.

Skull of average Murine proportions. Palatal foramina rather small. Choanæ not specially widened. Bullæ rather large. Incisors markedly opisthodont, the incisive index about 54°.

*Hab.* Interior of Australia, ranging over a wide area from the Northern Territory (Alroy), through Central Australia (Kullalpanima, Lake Eyre), to Western New South Wales. Type-locality Reedy Plains, near the junction of the Murray and Murrumbidgee.

*Type* in the Sydney Museum.

The common species over the greater part of Central and Northern Australia. Distinguished by its opisthodont incisors and narrow choanæ.

The following appears to be (or, more probably, to have been) a definable subspecies of *N. mitchelli*:—

5a. *Notomys mitchelli macropus*, subsp. n.

Essential characters of true *mitchelli*, but the feet longer and the fur longer and thicker; hairs of back about 8–9 mm. General colour more bluey-grey, not so brown as in *mitchelli*; the type, however, considerably faded. Under surface whitish with slaty bases. Feet more thickly haired than in *mitchelli*, white. Tail well-haired, pencilled, prominently bicolor.

Skull of type, so far as remains, as in *mitchelli*.

Dimensions of the type (measured on skin):—

Head and body 120 mm.; tail 153; hind foot 37; ear (wet) 26.

Skull: nasals 11·3; interorbital breadth 5·1; palatilar length 14; palatal foramina 6·2; upper molar series 5·1.

*Hab.* South Australia—believed to be Kangaroo Island.

*Type.* Adult. B.M. no. 55. 12. 34. 361. Collected by Dr. J. B. Harvey, who then lived in Kangaroo Island, and presented by him in 1841 to the Zoological Society's Museum. One specimen only.

6. *Notomys aquilo*, sp. n.

A small pale species with thin fur.

Size slightly less than in *mitchelli*. Fur thin, poor, not woolly. General colour pale sandy brown above, white below, the hairs white to their bases. A well-marked neck-gland present in the type. Feet thinly haired, flesh-coloured. Tail sandy brown, not conspicuously bicolor proximally.

Skull delicately built. Interorbital region flat, more parallel-sided than usual, less quickly broadening posteriorly. Lacrymal bones unusually large in the type, though this may be mainly due to age. Palatal foramina fairly large, well open. Anterior end of mesopterygoid fossa narrow, parallel-sided. Molars small. Incisors more or less orthodont, index of type 70°.

Dimensions of the type (measured on skin):—

Head and body 108 mm.; tail (imperfect); hind foot (wet) 35; ear (wet) 16.

Skull: back of parietals to front of nasals 26·3; nasals 11·2; interorbital breadth 5·2; palatilar length 13·2; palatal foramina 5·8; breadth of mesopterygoid fossa anteriorly 1·6; upper molar series 5.

*Hab.* Cape York, N. Queensland.

*Type.* Old male with worn teeth. B.M. no. 67. 9. 17. 2. Purchased of the dealer Higgins; collected by J. T. Cockerell.

This small northern species has the orthodont incisors of *cervinus* and the narrow choanæ of *mitchelli*, but is clearly distinct from both. It seems to be the only *Notomys* that occurs on the eastern coast of Australia, all the others being from west of the Dividing Range.

7. *Notomys cervinus*, Gould.

*Hapalotis cervinus*, Gould, P. Z. S. 1851, p. 127.

Size small; colour usually pale. Skull of about the size of that of *N. mitchelli*, but the palatal foramina larger and more open, the mesopterygoid fossa broader anteriorly, the bullæ smaller and the incisors orthodont, index about  $75^{\circ}$  to  $77^{\circ}$ , those of *N. mitchelli* being decidedly opisthodont.

*Hab.* The desert-region of Central Australia. Type from about  $29^{\circ} 6' S.$ ,  $141^{\circ} E.$

*Type* (lectotype). B.M. no. 53. 10. 22. 7. Collected 26th March, 1845, by Capt. Charles Sturt. From the Gould Collection.

This species and *N. mitchelli* occur together over a large area of Central Australia, and are often found in the same localities.

Finally, Gould's "*Hapalotis conditor*" is possibly a member of this genus, but there is no specimen of it in the British Museum, and species belonging to several genera were included in what he called "*Hapalotis*."

There is, however, the skull of a quite distinct *Notomys* in the collection, but, pending the discovery of any authentic specimen of *conditor*, I will neither definitely assign it to that species, nor, on the other hand, describe it as new.

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LII.—*Fossil Arthropods in the British Museum.*—VII.

By T. D. A. COCKERELL, University of Colorado.

A NEW lot of Burmese amber, presented to the Museum by Mr. Swinhoe, contains only one insect which I am prepared to describe, though there is a very interesting Psychodid fly which I hope Mr. Edwards will find time to investigate. The one insect is, however, of unusual interest, being a bee. It is closely allied to a species occurring in Sicilian amber, which is Middle Miocene. The other fossils now described are from the Gurnet Bay Oligocene.